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What is claimed is:

1. A method for effecting a select high temperature reaction comprising:

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- a) generating high temperature plasma radiation,
  - b) directing said high temperature plasma radiation through a reaction zone,
  - c) continuously flowing particles of matter to said reaction zone,
  - d) transferring sufficient heat, <sup>energy</sup> from the high temperature plasma in said reaction zone to said particles of said matter passing into said reaction zone to effect a high temperature reaction ~~to occur~~ with respect to the matter of said particles and to <sup>cause</sup> ~~effect~~ the formation of a plurality of select products of reaction, and
  - e) continuously separating said select products of reaction from each other after flowing same downstream of said reaction zone.

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2. A method in accordance with claim 1 wherein said high temperature reaction involves the separation of select atoms of molecules of ~~said~~ matter flowed to said reaction zone from each other by breaking the molecular bonds between said select atoms of molecules of said matter.

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3. A method in accordance with claim 1 wherein said matter is an ore containing metal atoms, further <sup>so</sup> ~~including~~ collecting said metal in a molten state.

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4. A method in accordance with claim 3 wherein said metal is deposited on a moving substrate and <sup>so</sup> ~~conveyed~~ thereby away from said reaction zone.

5. A method in accordance with claim 3 wherein said metal is continuously formed to shape and solidified beyond said reaction zone by one or more of the processes of continuous casting, rolling, molding or coating same on a substrate and solidifying same by cooling.

6. A method in accordance with claim 1 wherein said high temperature plasma radiation is generated by the discharge of electrical energy across electrodes located in the vicinity of said reaction zone.

7. A method in accordance with claim 1 wherein a plurality of plasmas are generated and particles of said matter are passed through said plurality of plasmas.

8. A method in accordance with claim 1 wherein said matter ~~is~~ formed of particles are molecules of waste products of a reaction such as combustion of fuel or incineration of waste and said reaction zone is connected to a reaction chamber such as a furnace or internal combustion engine.

9. A method in accordance with claim 8 further including sensing process variables including the ~~composition~~ of said waste products of reaction and generating sensing signals, computer processing and analyzing said sensing signals and generating control signals and employing said control signals to control the generation of said high temperature plasma radiation.

10. A method in accordance with claim 1 wherein said matter contains molecules containing carbon atoms, said method including separating said carbon atoms from the molecules containing same and forming synthetic diamond material thereof.

11. A method in accordance with claim 10 which includes depositing said carbon atoms onto a substrate and forming a film of said synthetic diamond material on said substrate.

12. A method in accordance with claim 1 wherein said particles are defined by molecules of water, said method including heating said water molecules by means of said plasma to separate hydrogen atoms from oxygen atoms of said water molecules.

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13. A method in accordance with claim 1 which includes providing a reaction chamber and generating a plurality of high temperature plasmas in said chamber wherein each of said plasmas is continuously generated and flowing said particles as a plurality of streams thereof to said plurality of plasmas to effect step (d).

14. A method in accordance with claim 1 wherein said plasma is generated by a plurality of radiation generating means selected from the group including an electrode pair across which a plasma arc is generated, microwave radiation, electron beam radiation, laser radiation and the like.

15. A method in accordance with claim 1 wherein said plasma is generated at a temperature in the range of 1700 degrees centegrade to heat said particles of said matter to a temperature in said range and to effect a pyroelectric reaction thereon.

16. A method for refining metal from ore containing atoms of said metal comprising:

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- a) comminuting ore to form small particles thereof,
  - b) flowing a stream of said small particles of ore to a reaction zone,
  - c) generating high temperature in said reaction zone sufficient to heat the matter of said small particles of said ore to a temperature sufficient to break the bonds between atoms of metal of said particles and molecules of matter containing said metal atoms so as to <sup>effect</sup> ~~allow~~ the separation of said metal atoms from the remaining matter of said ore,
  - d) collecting said metal as a flow of molten metal separated from the remaining matter of said ore.

17. A method in accordance with claim 17 wherein said metal forms particles such as droplets which are separated from the remaining matter of said ore by a process selected from the group of separation processes including centrifuging, gravity flow, magnetic separation, radiation beam force separation and filtration, further comprising continuously flowing the metal so formed as a molten stream or spray thereof to a shaping means such as a mold, die or rolling mill to form same to a select

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18. A method for reacting on waste gases and particles of high temperature reactions comprising:

pl a) flowing waste products of a reaction, such as a combustion reaction, incineration or the like through an elongated reaction chamber such as a duct,

pl b) generating a high temperature within said duct which temperature is above that of the temperature of said high temperature combustion reaction employed to generate said waste products,

67696747-050791 c) heating said waste products of said reaction to a temperature in the range of the high temperature generated in said duct to cause atoms of said waste products to have their bonds broken from the molecules of said waste products,

d) removing the reaction products generated in step (c) from said reaction chamber.

19. A method in accordance with claim 18 wherein step (b) is effected by means of intense radiation generated by one or more of devices selected from the group including electrically energized electrodes, lasers, electron guns and microwave energy generating means.

20. A method in accordance with claim 18 wherein step (d) results in the formation of solid waste ~~products~~ from gaseous molecules and step (c) is effected by controlled thermonuclear reaction means operable to heat said waste products to a temperature sufficient to separate atoms contained in said waste products from molecules thereof, further collecting said separated atoms as particles thereof per se or absorbed by other particles.